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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/980,275	05/16/2002	Masahiro Serizawa	P/ 126-213	3300

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EXAMINER

WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
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2626

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/980,275

Applicant(s)

SERIZAWA ET AL.

Examiner

James S. Wozniak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-88 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-88 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the office action from 6/8/2006, the applicant has submitted an amendment, filed 10/10/2006, amending claims 1, 34-35, 37, 39, 39, 50, 58, 60, 62, and 72-73, while arguing to traverse the art rejection based on the amended limitation regarding the smoothing of feature parameters in a classified voiceless period (*Amendment, Pages 24-25*). The applicant's arguments have been fully considered but are moot with respect to the new grounds of rejection in view of Oshikiri et al (*U.S. Patent: 6,202,046*).

2. Also, the applicant submitted a supplemental amendment on 12/1/2006, which due to a delay in processing, was not addressed in the prior Office Action from 12/27/2007. Since the applicant's supplemental amendment was filed prior to the mailing date of the previous action, the unaddressed amended and newly presented claims have been addressed in this Office Action.

Claim Objections

3. **Claims 74-86 and 88** are objected to because of the following informalities:

In claims 74-86 and 88, "said smoothing in a subsequent period" should be changed to – smoothing in a subsequent period-- in order to provide proper antecedent basis for this limitation.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claims 1-88** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-2, 4, 6, and 20-21 are drawn to a speech decoding device that smoothes abstract speech data to produce abstract smoothed speech data for decoding. In order for a claimed invention to be considered statutory under 35 U.S.C. 101, it must be useful and accomplish a practical application. That is, it must produce a “useful, concrete and tangible result” (*State Street*, 149 F.3d at *1373-74, 47 USPQ2d at 1601-02). Since the final result of the claimed invention is abstract smoothed speech data and not a tangible real-world output (*for example, decoded speech played using a speaker*), the aforementioned independent claims are directed to non-statutory subject matter, as are their associated dependent claims.

Claims 57-58, 60, 62, and 72-73 are drawn to a “program” data structure *per se*, stored on a “recording medium” not claimed as readable by a computer (*i.e., a claimed program description*), as recited in the preamble and as such is non-statutory subject matter. See MPEP § 2106.IV.B.1.a.

Data structures not claimed as embodied in computer readable media are descriptive material *per se* and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Such claimed data structures do not define any structural and

functional interrelationships between the data structure and other claimed aspects of the invention, which permit the data structure's functionality to be realized. In contrast, a claimed computer readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Similarly, computer programs claimed as computer listings *per se*, i.e., the descriptions or expressions of the programs are not physical “things.” They are neither computer components nor statutory processes, as they are not “acts” being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized to produce a tangible, concrete, and useful result. In the aforementioned independent claims, no such result is obtained because there is no claimed tangible output (*for example, decoded speech played using a speaker*) (*See State Street, 149 F.3d at *1373-74*, 47 USPQ2d at 1601-02- “The claimed invention as a whole must be useful and accomplish a practical application. That is, it must produce a “useful, concrete and tangible result.”). Thus, the aforementioned independent claims contain non-statutory subject matter, as do their associated dependent claims.

Although **claims 34-35, 37, 39, and 49-50** are directed to a seemingly patentable process, featuring speech decoding steps similar to those recited in claims 57-58, 60, 62, and 72-73, these claims are directed towards non-functional descriptive material (i.e., data structure description) by virtue of claims 57-58, 60, 62, and 72-73. Claims 57-58, 60, 62, and 72-73 indicate that these steps are part of program instructions. In claims 34-35, 37, 39, and 49-50, this data structure is

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not stored on a computer readable medium that enables the data structure's functionality to be realized when executed by a computer to achieve a "useful, concrete, and tangible result" (*see above*). Thus, the aforementioned independent claims are directed to non-statutory subject matter, for the same reasons as claims 57-58, 60, 62, and 72-73, as are their associated dependent claims.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 1-33** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 recites "a voice-less decoding circuit for decoding..." but lacks other means that enable the smoothing operation that the unit performs.

Claims 2, 4, 6, and 20-21 recite "a voice-less part decoding unit which changes..." but lacks other means that enable the smoothing operation that the unit performs.

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A

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single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor (*See MPEP 2164.08(a)*).

Dependent claims 3, 5, 7-19, 22-33 do not remedy the lack of enablement issue noted above with respect to claims 1-2, 4, 6, and 20-21, and therefore, are also rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claims 1-5, 7-10, 20-24, 26-30, 32-38, 40-43, 49-53, 55-61, 63-66, and 72-73** are rejected under 35 U.S.C. 102(e) as being anticipated by Oshikiri et al (*U.S. Patent: 6,202,046*).

With respect to **Claims 1, 34, and 57**, Oshikiri discloses:

A voice-less decoding circuit for decoding the speech signals in said voice-less period by smoothing at least one feature parameter representing spectral envelope characteristics, said

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feature parameter being from the feature parameter being from the feature parameters received in the voice-less period (*smoothing spectral parameters from a classified background noise period at a decoder, Col. 20, Lines 7-52*).

Oshikiri further discloses decoding method implementation as a program stored on a computer readable medium (*Col. 37, Line 50- Col. 8, Line 6*).

With respect to **Claims 2, 35, and 58**, Oshikiri recites:

A voice-less part decoding unit which changes, according to an elapsed time from a time point when a transition occurs from the voice period to the voice-less period, a coefficient used to smooth at least one of the feature parameters, and decodes the speech signal in the voice-less period by smoothing at least one of the feature parameters with the changed coefficient (*performing background noise decoding processing noted with respect to claim 1, according to an elapsed hangover period, Col. and Col. 20, Lines 7-52*).

Oshikiri further discloses decoding method implementation as a program stored on a computer readable medium (*Col. 37, Line 50- Col. 8, Line 6*).

With respect to **Claims 3, 36, and 59**, Oshikiri discloses:

The voice-less part decoding unit decodes the speech signal by using at least one of the received feature parameters as it is in a time period immediately after changing from the voice period to the voice-less period, and decodes the speech signal by using at least one smoothed feature parameter selected from the feature parameter after the time period (*passing features through smoothing processing during a hangover period and performing smoothing after a hangover period has elapsed, Col. 16, Lines 8-39; Col. 20, Lines 7-52; and Fig. 17*).

With respect to **Claims 4, 37, and 60**, Oshikiri discloses:

A voice-less part decoding unit that changes a value of a coefficient used to smooth at least one of the feature parameters according to the feature parameters, and decodes the speech signal in the voice-less period by smoothing at least one of the feature parameters with the changed value of the coefficient (*calculating a smoothing gain based on received feature parameters in a background noise period and applying the gain to the feature parameters, Col. 20, Line 7- Col. 21, Line 10*).

Oshikiri further discloses decoding method implementation as a program stored on a computer readable medium (*Col. 37, Line 50- Col. 8, Line 6*).

Claims 5, 7, 38, 40, 61, and 63 contain subject matter similar to Claim 3, and thus, are rejected for the same reasons.

Claims 8-9, 41-42, and 64-65 contain subject matter similar to Claims 2 and 3, and thus, is rejected for the same reasons.

With respect to **Claims 10, 43, and 66**, Oshikiri further recites:

The voice-less part decoding unit decodes the speech signal by using at least one of the received feature parameters as it is, in a first time period immediately after changing from the voice period to the voice-less period and in a second time period while the feature parameter satisfies a predetermined condition, and decodes the speech signal by using at least one smoothed feature parameter selected from the feature parameters after the first time period or the second time period is past (*passing features through smoothing processing during a hangover period and a speech period that follows a background noise period; and performing smoothing after a hangover period has elapsed, Col. 16, Lines 8-39; Col. 20, Lines 7-52; and Fig. 17*).

With respect to **Claims 20-21, 49-50, and 72-73**, Oshikiri discloses:

A voice-less part decoding unit which generates signals in the voice-less period by feeding an excitation signal composed of plural types of signal to a synthesis filter in the voice less period (*feature parameters, Col. 10, Lines 7-12; and excitation signals in a background noise period fed to a synthesis filter, Col. 20, Lines 7-52; and Fig. 17, Element 411*), wherein the voice-less part decoding unit comprises a weighting coefficient determining unit which determines a weighting coefficient used in a weighted sum operation of the plurality of types of signals in the voice-less period according to at least one feature parameter (*smoothing gain decoding and modification and weighting of excitation signals in a background noise period, Col. 20, Lines 7-52; and Figs. 17-18, Elements 407-408; and excitation signal generation utilizing an adder, Col. 37, Lines 6-23*), and the excitation signal generated by using the weighting coefficient is fed to the synthesis filter (*Col. 20, Lines 7-52; and Fig. 17*).

Oshikiri further discloses decoding method implementation as a program stored on a computer readable medium (*Col. 37, Line 50- Col. 8, Line 6*).

With respect to **Claims 22-24, 26-27, 51-53, and 55-56**, Oshikiri further discloses:

The feature parameters include at least one of a quantity representing spectral envelope of the signals to be decoded and a quantity representing power of the signals to be decoded (*speech feature parameters including power and spectral information, Col. 10, Lines 7-12*).

With respect to **Claims 28-30 and 32-33**, Oshikiri further discloses:

A coding device that determines whether the input signal is in a voice period or in a voice-less period for each frame and encodes the feature parameters of the input signals to output (*encoding means featuring a speech/noise classifier that encodes a classified signal, Col. 19, Lines 29-62*).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 6, 11-15, 25, 31, 39, 44-48, 54, 62, 67-71** are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshikiri et al in view of Swaminathan et al (*U.S. Patent: 5,537,509*).

With respect to **Claims 6, 39, and 62**, Oshikiri discloses the background noise decoder, as applied to Claims 1 and 34. Oshikiri further discloses decoding method implementation as a program stored on a computer readable medium (*Col. 37, Line 50- Col. 8, Line 6*). Oshikiri does not specifically suggest the use of information indicative of whether new speech feature parameters are transmitted or not to determine whether a received signal is speech or background noise for a smoothing determination, however, Swaminathan recites a discontinuous transmission (DTX) system that utilizes a voice activity flag, indicative of the presence or absence of new speech features, for such a purpose (*Col. 4, Lines 30-39; and Col. 5, Lines 11-23*). Swaminathan further discloses that feature parameters in a previous frame are gradually smoothed over time in a following voice inactivity period (*gradual adjustment of a weighting factor that changes spectral shape, Col. 5, Line 47- Col. 6, Line 28*).

Oshikiri and Swaminathan are analogous art because they are from a similar field of endeavor in speech coding systems utilizing spectral smoothing. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention, to modify the teachings of

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Oshikiri with the voice activity flag taught by Swaminathan in order to provide a means of conveniently indicating the presence of speech features in order to alleviate the annoyance and discomfort to a listener caused by on and off switching artifacts between intermittent periods of voice activity (*Swaminathan, Col. 2, Lines 23-27*).

Claims 11-12, 44-45, 67-68 contain subject matter similar to Claim 6, and thus, are rejected for the same reasons.

With respect to **Claims 13-15, 46-48, and 69-71**, Swaminathan further recites:

The voiceless part decoding unit receives information representing whether the feature parameters are sent at a sending location (*voice activity flag received at a speech decoder and sent at a transmitter, Col. 4, Lines 30-39; and Col. 5, Lines 11-23*).

With respect to **Claims 25 and 54**, Oshikiri further discloses:

The feature parameters include at least one of a quantity representing spectral envelope of the signals to be decoded and a quantity representing power of the signals to be decoded (*speech feature parameters including power and spectral information, Col. 10, Lines 7-12*).

With respect to **Claim 31**, Oshikiri further discloses:

A coding device that determines whether the input signal is in a voice period or in a voice-less period for each frame and encodes the feature parameters of the input signals to output (*encoding means featuring a speech/noise classifier that encodes a classified signal, Col. 19, Lines 29-62*).

With respect to **Claims 74-88**, Swaminathan further discloses:

Smoothing in a subsequent period is performed even when a new feature parameter is not received (*performing gradual smoothing over time as voice inactivity continues for the benefit of*

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alleviate the feeling of artificiality during long periods of voice inactivity, Col. 5, Line 47- Col. 6, Line 28; and Col. 7, Lines 8-10).

12. **Claims 16-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshikiri et al in view of Swaminathan et al and further in view of Jarvinen et al (*U.S. Patent: 5,960,389*).

With respect to **Claims 16-18**, Oshikiri in view of Swaminathan discloses the background noise decoder as applied to Claims 1-2 and 4. Oshikiri does not specifically suggest that when a length of a voice period immediately before a first voice-less period is shorter than a predetermined length, a value of a feature parameter which is finally transmitted in a second voice-less period immediately before the voice period is used as an initial value of smoothing. Jarvinen, however recites utilizing a previous noise parameter for smoothing upon the occurrence of a short speech burst (*Col. 21, Lines 16-35; Col. 15, Lines 19-46; and Col. 2, Lines 28-43*).

Oshikiri and Jarvinen are analogous art because they are from a similar field of endeavor in speech coding systems utilizing spectral smoothing. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention, to modify the teachings of Oshikiri with the concept of addressing a short speech burst taught by Jarvinen in order to prevent a speech burst from being misinterpreted as a background noise spike (*Jarvinen, Col. 14, Line 60- Col. 15, Line 3*).

13. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Oshikiri et al in view of Swaminathan et al and further in view of Jarvinen et al (*U.S. Patent: 5,960,389*).

With respect to **Claim 19**, Oshikiri in view of Swaminathan discloses the background noise decoder, utilizing a voice activity flag as applied to Claim 6. Oshikiri in view of Swaminathan does not specifically suggest that when a length of a voice period immediately before a first voice-less period is shorter than a predetermined length, a value of a feature parameter which is finally transmitted in a second voice-less period immediately before the voice period is used as an initial value of smoothing. Jarvinen, however recites utilizing a previous noise parameter for smoothing upon the occurrence of a short speech burst (*Col. 21, Lines 16-35; Col. 15, Lines 19-46; and Col. 2, Lines 28-43*).

Oshikiri, Swaminathan, and Jarvinen are analogous art because they are from a similar field of endeavor in speech coding systems utilizing spectral smoothing. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention, to modify the teachings of Oshikiri in view of Swaminathan with the concept of addressing a short speech burst taught by Jarvinen in order to prevent a speech burst from being misinterpreted as a background noise spike (*Jarvinen, Col. 14, Line 60- Col. 15, Line 3*).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Hayata (*U.S. Patent: 5,787,388*)- discloses a time-dependent smoothing filter for a voice-less period.

Hayata et al (*U.S. Patent: 5,809,460*)- teaches control of an interpolation coefficient in voice-less period smoothing.


Johnson (*U.S. Patent: 6,415,253*)- teaches the application of smoothing in a silence state to smooth out noise spectrum spikes.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached at (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
1/24/2007



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